Page 2, line 13 to line 17, delete current paragraph and insert therefor:

The collected measurement wave front (W2') is again reflected by the pinhole mirror 2 (W2"), and interferes with the reference wave front (W1) to thereby form an interference fringe on the CCD 4. A piezo device is provided on a holder (not shown) on the CCD 4, which slightly vibrates a test object to detect a change in the interference fringe with the CCD, and the surface profile is calculated by analyzing this change.

Page 5, line 7 to line 12, delete current paragraph and insert therefor:

In view of the above problems, it is an object of the present invention to provide a point diffraction interferometer which can measure the surface profile of a test object having a large NA with high precision (capable of measuring a profile irregularity of about 0.2 nmrms). Moreover, it is another object of the present invention to provide a manufacturing method for a reflecting mirror and a projection exposure apparatus comprising a reflecting mirror manufactured by this manufacturing method.

Page 5, line 14 to line 21, delete current paragraph and insert therefor:

The present invention relates to a point diffraction interferometer which measures a surface profile on a surface to be measured by, irradiating light irradiated from a light source to a pinhole mirror via a collective optical system, irradiating a part of the light diffracted from a pinhole provided in the pinhole mirror to the surface to be measured as a luminous flux for measurement, making the luminous flux for measurement reflected by the surface to be measured interfere with a reference luminous flux which is an other part of light diffracted from the pinhole, and detecting the state of an interference fringe caused by the interference.

Page 7, line 20 to page 8 line 3, delete current paragraph and insert therefor:

The present invention is also characterized by a point diffraction interferometer which measures a surface profile of a surface to be measured by, irradiating polarized light irradiated from a light source to a polarization retention fiber, irradiating a part of the polarized light emitted from this fiber to the surface to be measured as a luminous flux for measurement,

making the luminous flux for measurement reflected by the surface to be measured interfere with a reference luminous flux which is an other part of polarized light emitted from the fiber, and detecting the state of an interference fringe caused by the interference, wherein a $\lambda/2$ plate comprising a rotatable mechanism is arranged between the light source and the polarization retention fiber.

Page 8, line 9 to line 17, delete current paragraph and insert therefor:

The present invention is also characterized by a point diffraction interferometer which measures a surface profile of a surface to be measured by, irradiating light irradiated from a light source to a single-mode fiber, irradiating a part of the light emitted from this fiber to the surface to be measured as a luminous flux for measurement, making the luminous flux for measurement reflected by the surface to be measured interfere with a reference luminous flux which is an other part of polarized light emitted from the fiber, and detecting the state of an interference fringe caused by the interference, wherein a dielectric multilayer reflection coating is formed on an end face on the surface side to be measured of the single-mode fiber.

Page 8, line 21 to line 25, delete current paragraph and insert therefor:

The present invention is also characterized by a manufacturing method for a reflecting mirror in which a multilayer film obtained by alternately laminating a heavy element layer and a light element layer on a substrate is formed, which comprises at least a step for measuring the surface profile, using either of the above described point diffraction interferometers.

Page 11, line 6 to line 10, delete current paragraph and insert therefor:

On the other hand, it is known that when the pinhole diameter becomes 1/2 or less of the laser wavelength, the light quantity abruptly decreases. When the light quantity decreases, CCD noise increases, and hence an S/N ratio for sufficiently detecting the surface profile of the test object cannot be obtained. As a result, high precision measurement becomes impossible.

Page 17, line 20 to page 18, line 7, delete current paragraph and insert therefor:

A case where a surface profile of a reflecting mirror for EUVL is measured using the PDI of the present invention will now be described. The reflecting mirror for EUVL has a multilayer film obtained by alternately laminating a heavy element layer and a light element layer on a substrate. As the substrate, there can be used a substrate of glass, fused quartz, silicon monocrystal, silicon carbide or the like, with the substrate surface polished so as to become sufficiently smooth, compared to the used wavelength. Moreover, as the heavy element layer, there can be used a thin film of, for example, scandium (Sc), titanium (Ti), vanadium (V), chromium (Cr), iron (Fe), nickel (Ni), cobalt (Co), zirconium (Zr), niobium (Nb), molybdenum (Mo), technetium (Tc), ruthenium (Ru), rhodium (Rh), hafnium (Hf), tantalum (Ta), tungsten (W), rhenium (Re), osmium (Os), iridium (Ir), platinum (Pt), copper (Cu), palladium (Pd), silver (Ag) or gold (Au). As the light element layer, there can be used a thin film of, for example, silicon (Si), carbon (C), beryllium (Be), silicon nitride (Si_3N_4), or boron nitride (BN).

Page 18, line 13 to line 16, delete current paragraph and insert therefor:

Reflecting mirrors which do not achieve the predetermined surface profile are machined again, and after a multilayer film has been formed, measurement of surface profile is performed. Until the predetermined surface profile is achieved, this step is repeated to manufacture the reflecting mirror.

IN THE CLAIMS:

Please replace claims 1-4 and 6-9 as follows:

1. (Amended) A point diffraction interferometer which measures a surface profile of a surface to be measured by, irradiating light irradiated from a light source to a pinhole mirror via a collective optical system, irradiating a part of the light diffracted from a pinhole provided in the pinhole mirror to said surface to be measured as a luminous flux for measurement, making said luminous flux for measurement reflected by the surface to be